

NOTES ON *NOSODENDRON CALIFORNICUM* HORN ON
SLIME FLUXES OF GRAND FIR, *ABIES GRANDIS*
(DOUGLAS) LINDLEY, IN NORTHERN IDAHO
(COLEOPTERA: NOSODENDRIDAE)¹

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ABSTRACT

Adults and larvae of *Nosodendron californicum* Horn were observed and collected from sap exudations on and adjacent to frost cracks of *Abies grandis* (Douglas) Lindley. This is the first published record of this species in Idaho and east of the Cascade Range in the Pacific Northwest.

INTRODUCTION

The habitat-niche of *Nosodendron californicum* Horn in the western United States is delimited as slime fluxes (i.e., infected sap exudations from tree wounds) of white fir, *Abies concolor* (Gord. and Glend.) Lindl. (Hayes and Chu, 1946, and Sokoloff, 1959), grand fir, *Abies grandis* (Douglas) Lindley (= *Picea grandis* in Fletcher, 1902), and the California black oak, *Quercus kelloggii* Newb. (Sokoloff, 1959, 1964). Records of *N. californicum* in the West are California (Arnett, 1968), southwest British Columbia, western Washington, and southwestern Oregon (Hatch, 1961).

GENERAL OBSERVATIONS

Three adults were taken from frost cracks of grand fir, *Abies grandis*, that were exuding sap in June, 1972. This is the first record of *N. californicum* for Idaho and the region east of the Cascade Range in the West. The following year, grand fir trees were examined, and adults and larvae were collected on sap exudations from frost cracks on 15 trees. These trees had fruiting structures of *Echinodontium tinctorium* (Ell. and Ev.) Ell. and Ev., the Indian paint fungus which causes a severe heartrot of grand fir in Idaho. Trees ranged from 30-35 cm in diameter (breast height) and were greater than 120 years in age. Host trees were found in the mixed conifer forest of the *Abies grandis*/*Pachistima myrsinites* (Pursh) Raf. and *Thuja plicata* Donn/*Pachistima myrsinites* habitat types (Daubenmire and Daubenmire, 1968).

One host grand fir (Fig. 1) was selected for study and observation of *N. californicum* throughout the 1973 field season (5 July to 24 September 1973). Temperature recordings and observations were made periodically throughout the summer. Sap exudation was underway when the first observation of the beetles were made. By early July, adults and 3 larval instars were observed on the frost crack exudations up to 1 m above the root collar.

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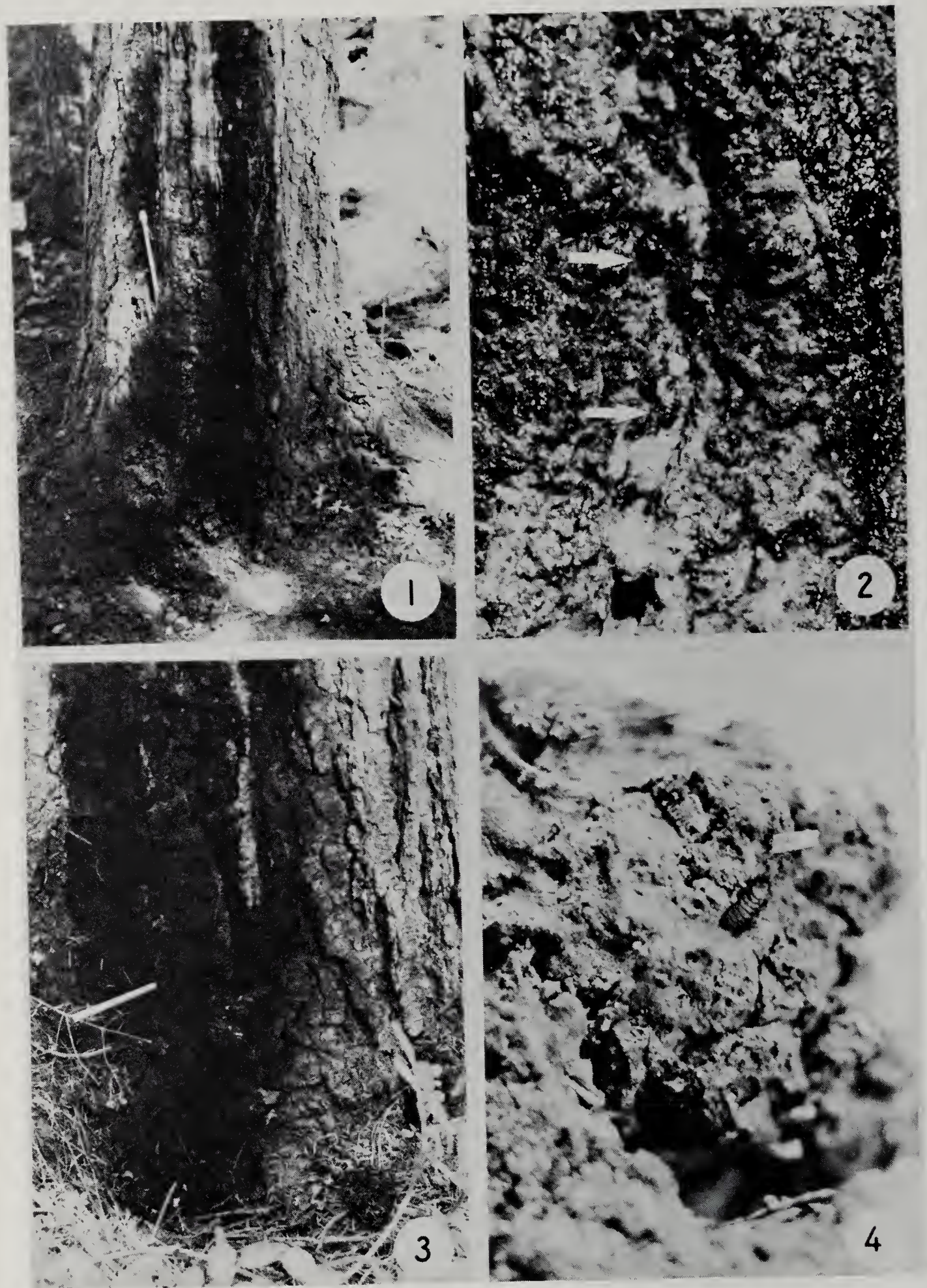


Fig. 1-4. Habitat of *Nosodendron californicum*: 1) trunk of host tree of *Abies grandis*, showing a characteristic frost crack with sap exudation; 2) close up of frost crack in Fig. 1, showing exudations and *N. californicum* adult and larva (arrows); 3) close up of exudation puddle at base of host tree taken in late summer (overwintering site); 4) larval overwintering site in clayish surface soil found at the frost crack base.

Adults and larvae are cryptic and were found covered with sap exudations within 2 cm of the center of the frost crack (Fig. 2). However, greater numbers of adults and larvae were found throughout a moistened mass of grand fir needles and decomposing litter with accumulated sap exudations at the base of the frost crack (Fig. 3). The pH value of the sap exudate varied from 4.0 to 6.0 throughout the summer. The maximum extent of the exudate puddle at the base of the frost crack was $9 \times 25 \times 4$ cm deep with the beetles found throughout this area. As the season progressed, the volume of exudate from the frost crack decreased as moisture relations within the forest became more severe. By mid-August, adults and larvae were no longer present on the frost crack, but were confined to the damp litter and duff at the base of the host tree where the frost crack exudate had drained. As the exudate puddle dried out, adults and larvae of *N. californicum* became inactive and were found incrustated in the decomposed litter and clayish surface soil at the base of the host tree. Adults and larvae were observed in this condition by early September. Observations were made again in mid-March 1974, and adults and larvae were found still incrustated in the soil (Fig. 4) and against the tree bole between the root collar and the clayish soil from 2 to 8 cm below ground level. Observations on adult and larval behavior are being continued throughout the 1974 season. Distribution of the beetle is being studied throughout northern Idaho, Washington, and Oregon.

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